<u>Amendments to the Claims</u>:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for storing information in a three dimensional optical memory storage device, comprising:

subjecting a nanocomposite to irradiation, said nanocomposite comprising a matrix of particles of a liquid core resin surrounded by an inner shell resin and an outer shell resin, said outer shell resin forming a continuous phase of the matrix, said particles of liquid core resin containing at least one photosensitive compound and being in an array in said matrix, said continuous phase being substantially free of said photosensitive compound;

said irradiation being selectively focused on individual particles in said array to effect photobleaching of said individual particles, said irradiation being two-photon irradiation of a wavelength to effect said photobleaching, and said irradiation being selectively focused on individual particles such that at least one particle adjacent to the selected particle in the direction of irradiation are photobleached by less than 25%.

2. (Previously Presented) The method of claim 1, in which the irradiation is a single beam of irradiation selectively focused on individual particles.

3. (Previously Presented) The method of claim 2, in which the two-photon-induced photobleaching causes each particle to perform as an individual bit.

4. (Canceled)

5. (Previously Presented) The method of claim 2, in which the selected particle is photobleached by more than 50%.

6. (Previously Presented) The method of claim 2, wherein the particles of the nanocomposite have an average diameter from about 100 to about 3,000 nanometers and a polydispersity of about 1.00 to 1.10.

7. (Previously Presented) The method of claim 1, wherein both the liquid core resin and the inner shell resin are comprised of copolymers of poly(methyl methacrylate) and poly(butyl acrylate).

8. (Previously Presented) The method of claim 7, wherein the copolymers further contain ethylene glycol dimethacrylate as a comonomer.

9. (Previously Presented) The method of claim 2, wherein the particles are present in a concentration of from about 10^{11} to about 10^{16} particles per cubic centimeter.

10. (Previously Presented) The method of claim 2, wherein the photosensitive compound is present in an amount of from about 0.015 to about 0.5 molar percent based on the total weight of the liquid core resin.

11. (Previously Presented) The method of claim 2, wherein the photosensitive compound is selected from the group consisting of photochromic, fluorescent, phosphorescent and mixtures thereof.

12. (Previously Presented) The method of claim 2, wherein the photosensitive compound is 4-amino-7-nitrobenzo-2-oxa-1,3-diazol.

13. (Previously Presented) The method of claim 1, wherein the liquid core resin has a low glass transition temperature and the inner shell resin is synthesized from a rigid polymer.

14. (Previously Presented) The method of claim 1, wherein a relationship between glass transition temperatures of the liquid core resin, the inner shell resin and the outer shell resin is (liquid core resin T_g) < room temperature; (inner shell resin T_g) > (outer shell resin T_g) > (liquid core resin T_g); and (outer shell resin T_g) > room temperature.

15. (Previously Presented) A nanocomposite comprising a matrix of particles for three dimensional optical memory storage, the particles comprising:

a liquid core resin containing at least one photosensitive compound;

an inner shell resin encapsulating the liquid core; and

an outer shell resin encapsulating the core resin and the inner shell resin;

wherein the outer shell resin forms a continuous phase of the matrix, and the particles are arranged in an array in the matrix.

16. (Previously Presented) A nanocomposite of claim 15, wherein a glass transition temperature of the liquid core resin is less than a glass transition temperature of the inner shell resin and the outer shell resin.

17. (Previously Presented) The nanocomposite of claim 15, wherein a glass transition temperature of the outer shell resin is less than a glass transition temperature of the inner shell resin.

18. (Previously Presented) The nanocomposite of claim 15, wherein a relationship between glass transition temperatures of the liquid core resin, the inner shell resin and the outer shell resin is (liquid core resin T_g) < room temperature; (inner shell resin T_g) > (outer shell resin T_g) > (liquid core resin T_g); and (outer shell resin T_g) > room temperature.

19. (Previously Presented) The nanocomposite of claim 15, wherein the liquid core resin and the inner shell resin both comprise polymers derived from at least the same monomers.

20. (Previously Presented) The nanocomposite of claim 15, wherein the liquid core resin and the inner shell resin both comprise copolymers of poly(methyl methacrylate) and poly(butyl acrylate).

21. (Previously Presented) The nanocomposite of claim 19, wherein a weight ratio of poly(butyl acrylate) to poly(methyl methacrylate) in the inner shell resin is from above about 0.0 to about 0.25.

22. (Previously Presented) The nanocomposite of claim 19, wherein a ratio of poly(butyl acrylate) to poly(methyl methacrylate) in the liquid core resin is from about 40 to about 70, mole percentage basis, and the ratio of poly(butyl acrylate) to poly(methyl methacrylate) in the inner shell resin is from about 5 to about 10, mole percentage basis.

23. (Previously Presented) The nanocomposite of claim 20, wherein the copolymers further contain ethylene glycol dimethacrylate as a comonomer.

24. (Previously Presented) The nanocomposite of claim 15, wherein the inner shell resin is crosslinked.

25. (Previously Presented) The nanocomposite of claim 15, wherein an average diameter of the liquid core is from about 50 nm to about 1 nm.

26. (Previously Presented) The nanocomposite of claim 15, wherein an average thickness of the inner shell resin is from about 20 to about 60 nm.

27. (Previously Presented) The nanocomposite of claim 15, wherein a weight ratio of the inner shell resin to the liquid core resin ranges from above about 0.0 to about 2.0.

28. (Previously Presented) The nanocomposite of claim 15, wherein the particles of the nanocomposite have an average diameter from about 100 to about 3,000 nanometers and a polydispersity of about 1.00 to about 1.10.

29. (Previously Presented) The nanocomposite of claim 15, wherein the particles are present in a concentration of from about 10^{11} to about 10^{16} particles per cubic centimeter.

30. (Previously Presented) The nanocomposite of claim 15, wherein the liquid core resin further contains a photosensitive compound.

31. (Previously Presented) The nanocomposite of claim 30, wherein the photosensitive compound is present in an amount of from about 0.015 to about 0.5 molar percent based on a total weight of the liquid core resin.

32. (Previously Presented) The nanocomposite of claim 30, wherein the photosensitive compound is selected from the group consisting of photochromic, fluorescent, phosphorescent and mixtures thereof.

33. (Previously Presented) The nanocomposite of claim 30, wherein the photosensitive compound is 4-amino-7-nitrobenzo-2-oxa-1,3-diazol.

34. (Previously Presented) The nanocomposite of claim 15, wherein the core has a glass transition temperature of from about -50°C to about 15°C; wherein the inner shell resin has a glass transition temperature of from about 100°C to about 150°C; and wherein the outer shell resin has a glass transition temperature of from about 60°C to 90°C.

35. (Previously Presented) A method for storing information in a three dimensional optical memory storage device, the three dimensional optical memory storage device comprising a nanocomposite comprising a continuous matrix of polymer resin and a multiplicity of individual particles in an array in the continuous matrix, the individual particles comprising a liquid core resin comprising at least one photosensitive compound and surrounded by an inner shell resin and an outer shell resin, the outer shell resin forming part of the continuous matrix and being substantially free of said photosensitive compound, the method comprising:

selecting at least one individual particle of the nanocomposite; and

irradiating the at least one individual particle with two-photon irradiation;

wherein, in response to the two-photon irradiation, the at least one individual particle is photobleached, and at least one individual particle adjacent to the selected at least one individual particle is photobleached by no more than about 25 %.

36. (Previously Presented) The method according to claim 35, in which the selected particle is photobleached by more than 50%.

37. (Previously Presented) A nanocomposite for three dimensional optical memory storage, comprising a continuous matrix of resin and a multiplicity of individual particles arranged in an array in the continuous matrix, the individual particles comprising a liquid core resin comprising at least one photosensitive compound and surrounded by an inner shell resin and an outer shell resin, the outer shell resin forming part of the continuous matrix and being substantially free of the photosensitive compound.

38. (Currently Amended) A nanocomposite of ~~claim 38, wherein~~claim 37, wherein a glass transition temperature of the liquid core resin is less than a glass transition temperature of the inner shell resin and the outer shell resin.

39. (Currently Amended) The nanocomposite of ~~claim 38, wherein~~claim 37, wherein a glass transition temperature of the outer shell resin is less than a glass transition temperature of the inner shell resin.

40. (Currently Amended) The nanocomposite of ~~claim 38, wherein~~claim 37, wherein a relationship between glass transition temperatures of the liquid core resin, the inner shell resin and the outer shell resin is (liquid core resin T_g) < room temperature; (inner shell resin T_g) > (outer shell resin T_g) > (liquid core resin T_g); and (outer shell resin T_g) > room temperature.

41. (Currently Amended) The nanocomposite of ~~claim 38, wherein~~claim 37, wherein the individual particles are present in a concentration of from about 10^{11} to about 10^{16} particles per cubic centimeter.

42. (Currently Amended) The nanocomposite of ~~claim 38, wherein~~claim 37, wherein the photosensitive compound is selected from the group consisting of photochromic, fluorescent, phosphorescent and mixtures thereof.

43. (Currently Amended) The nanocomposite of ~~claim 38, wherein~~claim 37, wherein the photosensitive compound is 4-amino-7-nitrobenzo-2-oxa-1,3-diazol.

44. (Currently Amended) The nanocomposite of ~~claim 38, wherein~~claim 37, wherein the liquid core resin has a glass transition temperature of from about -50°C to about 15°C; wherein the inner shell resin has a glass transition temperature of from about 100°C to about 150°C; and wherein the outer shell resin has a glass transition temperature of from about 60°C to 90°C.

45. (Previously Presented) A method for storing information in a three dimensional optical memory storage device, comprising:

subjecting a nanocomposite to irradiation, said nanocomposite comprising a matrix of particles of a liquid core resin surrounded by an inner shell resin and an outer shell resin, said outer shell resin forming a continuous phase of the matrix, said particles of liquid core resin containing at least one photosensitive compound and being in an array in said matrix, said continuous phase being substantially free of said photosensitive compound;

said irradiation being selectively focused on individual particles in said array to effect photobleaching of said individual particles by not more than 50%, said irradiation being two-photon irradiation of a wavelength to effect said photobleaching.

46. (Previously Presented) A method for storing information in a three dimensional optical memory storage device, the three dimensional optical memory storage device comprising a nanocomposite comprising a continuous matrix of polymer resin and a multiplicity of individual particles in an array in the continuous matrix, the individual particles comprising a liquid core resin comprising at least one photosensitive compound and surrounded by an inner shell resin and an outer shell resin, the outer shell resin forming part of the continuous matrix and being substantially free of said photosensitive compound, the method comprising:

selecting at least one individual particle of the nanocomposite; and

irradiating the at least one individual particle with two-photon irradiation,

wherein, in response to the two-photon irradiation, the at least one individual particle is photobleached by at least 50%.

47. (Previously Presented) The method of claim 1, wherein subjecting a nanocomposite to irradiation comprises said irradiation being selectively focused on individual particles such that all particles adjacent to the selected particle in the direction of irradiation are photobleached by less than 25%.

48. (Previously Presented) The method of claim 35, wherein, in response to the two-photon irradiation, all individual particles adjacent to the selected at least one individual particle are photobleached by no more than about 25%.